

JACG TRACE

NEWSLETTER
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THE JERSEY ATARI COMPUTER GROUP

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From the Editor's
Desk...

To Editors of Other Newsletters

A small but irritating practice has crept into this part-time business of newslettering. It involves the common courtesy of giving credit where credit is due.

I recently received a newsletter which properly criticized me for re-publishing an item with the wrong credit line. The fact of the matter is the JACG Newsletter zealously identifies authors and sources whenever we reprint from another's work. In this case we assumed the publishing newsletter was the originator. It was not and had not bothered to credit the originator. How were we to know?

As a result of this attitude of "take what I want" the author was thrilled to see his work honored with a new appearance and downtrodden to see someone else get the credit. That is very unfair.

Most newsletters print a statement allowing reprinting as long as credit and origin are given. That certainly is our policy. We, however, often find many of our items reprinted with no credit line.

To quote my offended fellow-editor, "Come on, guys, let's get your act together." It's the only courteous thing to do.

Frank Pazel
Editor-in-Chief, JACG Newsletter



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MARK YOUR CALENDARS!!

JACG Meeting Schedule

December 14, 1985
January 11, 1986
February 8, 1986
March 8, 1986
April 12, 1986

From The Conn.....

After a year of commanding the starship JACG it is time to turn the command over to another. I have received new orders from Starfleet Command and I must obey them.

No, no. This is not the 23rd century. I am not Captain, wait, Admiral Kirk. And you are not part of the 435 person crew of the U.S.S. Enterprise. But as I said a year ago when I first made the Star Trek analogy, being president of JACG is much like commanding the Enterprise.

In a well run ship (star or sailing) or in a well run organization, the person at the helm merely steers since all of the other functions of the ship/organization are taken care of. That has been true with JACG. In no special order, I want to thank the officers of JACG for the excellent job they have done. Frank Pazel has been Newsletter Editor since I left the post in November 1983. He has done an outstanding job and ensures that the JACG newsletter is consistently number one in the country.

Ron Kordos has tirelessly kept the books for the club and made sure that we didn't outspend ourselves. When I read the newsletters from other Atari groups around the country and learn about the financial difficulties that many of the clubs have experienced, I am all the more grateful for having an honest, professional person in charge of the finances.

Scott Brause has done an awful lot of work on the club BBS. His dedicated attitude has kept the board up and running and full of features. Our secretary, Larry Moriano and now Bob Mulhearn has the thankless task of getting the newsletters out to the club members. The fact that they do it, on time, and reliably speaks for itself.

Don Ursem has been club Librarian since the beginning of JACG. He and his dedicated crew of Richard Lamb, Dennis Hoskins, Ken McCollough are responsible for our vast collection of library volumes. Ali Chaudry took the job of Program Chairman at a time when we were having trouble getting volunteers. Ali did a good job of making sure the meetings were full. It's not always easy to please an audience of a couple hundred Atari users. Advertising was admirably handled by Joe Rowland. Again, Joe stepped forward in the club's time of need. The other person who deserves all of our thanks is Ron Davis who makes sure the auditorium is open and the equipment is set up for the meeting.

As I said before, when the jobs of the organization are in capable hands, the leader has little work to do. Thank you to all of the officers who made my job easy. The success of JACG is a tribute to your fine work.

Now for some personal reflections on being the president of the best Atari User Group in the country. When I decided to become the president of the Jersey Atari Computer Group, there were some serious doubts about the future of the club and the future of Atari.

Jack Tramiel and friends had recently taken over the reigns of Atari. However, no

information was coming out of the company and the future of Atari seemed questionable. With no Atari and with the problem we were having getting volunteers to help with the club, the future of JACG looked questionable.

Here we are a year later. JACG looks healthier than ever. I am particularly excited by the new slate of officers. Bill Martin is an enthusiastic guy and will, as president, lead the club in new directions. Jerry Frese is also a bundle of energy and will as Program Chairman ensure that the meetings are worth attending. With Shree Vandenberg as Treasurer and Helene Rotundo as Advertising Director, I feel confident that the Jersey Atari Computer Group is in good hands.

As far as Atari goes, I think the jury is still out. There's no question that the 520ST computer is a tremendous amount of computing power for the money. Look, the 520ST with color RGB monitor costs less than I paid for my Atari 800 and disk drive three years ago. However, I don't really know what the typical consumer is expected to do with an ST that they can't do with an 8-bit Atari computer.

The other concern I have about the future of Atari is that basically, the folks at Atari are what I call slimeballs and liars. They are in this thing for the money, they are businessmen (notice MEN - they are all men), and their goal is to get the "best deal" on what ever they are doing. If that means requiring user groups to pay the postage when returning their questionnaire, they'll do it. If that means screwing Synapse out of millions of dollars, they'll do it. If that means not having a toll free phone number for support or establishing authorized service centers, they'll do it. THEY'LL DO IT and they have.

As far as liars go, the folks at Atari lie all the time. Sam Tramiel told me in March at the Antic meeting that the PLATO cartridge would be out in two weeks. It ain't out yet. Sig Hartman told me in June at CES that GEM would never be in ROM on the ST, then they changed their minds. We have been promised Atariwriter Plus, the new printers, and countless other software and hardware by the men at Atari.

I have since learned not to believe ANYTHING they say. They're liars. Here's the killer, Atari maintains that they are providing user group support. That's a real load of crapola. One guy, David Duberman (nothing personal against Dave mind you), does not user group support make. The best example of Atari's level of "support" is the user group deal to buy STs. They said the groups would get a discount (slimeballs) and that the groups would receive the machines before they were shipped to the stores (liars). As it turned out, you could buy an ST in the stores before the user groups got them and you could buy them cheaper at most stores.

It's one thing to be in business and want to make a profit. But the attitude and business practices of Atari make me seriously question the long-term viability of their company and product. Can you imagine IBM or AT&T treating their customers this way?

Continued on Page 31

OCTOBER MEETING HIGHLIGHTS

Reported by
Joseph S. Kennedy

Since Art was still on the road from Philadelphia bringing our guest speaker to the meeting, Frank Pazel opened the meeting for the question and answer period. As is usual we had a quite a number of questions on different aspects of the Atari computer all of which the questioner got some assistance on if not the definitive answer. There were also announcements of the following bulletin boards (all said to be up and running):

Holly Park RCPM BBS
201-757-1491 (Ring Back - 24 hr.)
This is an RCPM board so use ASCII
when calling.

Bayway Atari Computer Enthusists
201-232-1730 (24 hr.)

Unnamed board
201-464-1296
8 - 10PM 7 nights

Scott Brause introduced the candidates for office. Elections will be held in November. Scott also announced that as soon as the hard disk is back from the manufacturer he will be ready to put to BBS back on line.

Frank Pazel talked about Home Computer Magazine which now includes Atari coverage (about time they wised up!!). This seems to be a well received magazine as it was given rave reviews by many members. Frank also announced the formation of a Robotics SIG; those interested should contact Bill Brandt. Trifocus has offered printers to the group at \$125. The printer is Epson compatible and has square pins and both tractor and friction feed. More will be covered on this at the November meeting. Frank introduced visitors from the JACS and showed us some graphics from the Print Shop graphics disk put together by the JACS. Copies of this disk will be in the library next meeting.

Art finally arrived and made the following announcements:

- Ron Luks of Compuserve will be at the November meeting
- Starting in November the ST portion of the meeting will be after the regular meeting
- Complimentary copies of Home Computer Magazine were available after the meeting.
- Brochures on a velcro closing 3 1/2" disk holder were also available.
- Analog magazine programs should be available in the library soon.

The main speaker for the meeting was Neil Harris, the publisher of The Atari Explorer magazine and the Atari BBS Sysop. Neil showed us the Neo-Chrome graphics

program for the ST. He also showed us the XT381 modem for the 8 bit computers. The XM301 lists for \$49.95; runs at 300 baud; is autodial/autoanswer and the terminal software was written by Russ Wetmore. This product is in the warehouse now. The 201 Printer is due into the warehouse the end of October. Soon to be released software includes the Learning Phone (Plato homelink), Atariwriter+ (2 sided disk for 800 and 130XE and includes a spelling checker), Silent Butler (a home financial helper) and Music Painter (a music creator). Neil also informed us that several software houses including Excellent, Broderbund and Batteries Included were preparing software for the 130XE. Atari will be distributing to dealers and users groups copies of ST Write, ST BASIC and Neo-Chrome for distribution to ST purchasers. These are sample versions and will not have all the features of the final commercial copies. Atari is also preparing a 32 bit processor as an add-on to the ST that will use the ST's I/O and Graphics. They are also preparing an 8 slot expansion box for the ST. Atari will be at Comdex and CES. Atari is developing a national on-line service that will be handled by the Source but there will be no sign-up fees and will cost \$6/hr in the evening and \$10/hr in the daytime. This should have a full range of services. This comes as a result of the Atari BBS (408-745-5308) which has been receiving 100 calls per week. After his talk Neil answered several questions from the group during which he stated the following:

- the ST developers pack is available for \$300 check or MO from
Atari Corp.
1196 Borregas Ave.
Sunnyvale, CA
94086
Attn: Richard Frick

- Atari will not make a hard disk for the 130XE

- Atari is developing a 1200 baud modem for the ST, not the 8 bit line

- there are presently 200 employees at Atari

Our thanks to Neil Harris for his time with us and a great talk. We must also thank Art for taking the time to drive to Philadelphia to pick-up Neil bring him to the meeting and then drive him back to Philadelphia. Thanks Art!

GIVE A BIT!!

This is your newsletter.

Please contribute to it!

Why Arrays? (Part 2)

by Richard Kushner

In the October issue of this newsletter we began our discussion on arrays. Please review to that article before continuing with the following discussion. We presented arguments why arrays are valuable, the rules for their use with Atari BASIC and explored one-dimensional arrays. Now we will go on to two dimensional arrays, expand on our examples and summarize.

So far we have used arrays as sort of one-dimensional lists. What if we wanted to not only include the uniform numbers of each Little Leaguer, but also their ages and telephone numbers? We could, of course, have three separate arrays to handle this. However, once again, Atari BASIC comes to our rescue with the *two-dimensional array*.

The best way to explain a two-dimensional array is to see one, as in TABLE 1.

TABLE 1

PLAYER	UNIFORM NO.	AGE	PHONE NO.
1	23	10	5551234
2	12	9	5559876
3	35	11	5554321
4	10	11	5556789

and so on for the other 21 players.

We have gone from a one dimensional list to a two-dimensional table. The "rules" we listed earlier, however, also apply to twodimensional arrays. We must DIMension the array with a statement like

```
10 DIM PLAYER(25,3)
```

or

```
10 DIM PLAYER(3,25)
```

Either way is correct, it is just a matter of how you prefer to visualize the array. In the first case, the array can best be thought of as a row across representing the 25 players, with the three pieces of information about each player listed underneath each player. In the second case, we have a column representing the 25 players, with three parallel columns containing the data of interest. The example above fits this second description. Thus PLAYER(3,4) in our example is the third piece of information (the phone number) of PLAYER(4), which is 5556789. Keep in mind that either layout can be used, but it will affect which elements store which information.

A word of caution. The mathematics of two-dimensional arrays gets somewhat abstract when you start manipulating items contained in the array. Your program may involve sorting the array and use a statement like

```
100 IF PLAYER(I+1,J+1)>PLAYER(I,J) THEN  
PLAYER(I,J)=PLAYER(I+1,J+1)
```

You will be all right as long as you keep in mind the rectangular format of the array and which subscript refers to the rows and which refers to the columns. It is always good practice to first run your program with known data to be sure that the right numbers come out when known numbers go in. Arrays gone awry are a good example of the computer axiom "GIGO" - Garbage In, Garbage Out!

Let's further reinforce our growing knowledge of arrays with another example. As a present we received a weather station and we've been recording the temperature at 6:00AM, Noon and 6:00PM each day for one week. We want to write a program to accept all this information and then print it out in an orderly table, including the average temperature for each day. We know that the average temperature is just the sum of the three daily temperatures divided by three.

We have seven days worth of data and three measurements each day clearly a perfect candidate for a (7,3) array. LISTING 4 shows one way to write a program to accomplish our goals.

LISTING 4

```
90 REM * FIND AVERAGE TEMPERATURE  
95 DIM TEMP(7,3)  
100 FOR DAY=1 TO 7  
110 FOR READING=1 TO 3  
120 READ TEMP  
125 TEMP(DAY,READING)=TEMP  
130 NEXT READING  
140 NEXT DAY  
175 REM  
180 PRINT "    TEMPERATURE"  
190 PRINT "Day 6AM 12N 6PM Avg."  
200 FOR DAY=1 TO 7  
202 PRINT DAY;"  ";  
205 TOTAL=0  
210 FOR READING=1 TO 3  
220 TOTAL=TOTAL+TEMP(DAY,READING)  
230 PRINT TEMP(DAY,READING);"  ";  
240 NEXT READING  
250 PRINT TOTAL/3  
260 NEXT DAY  
980 REM  
1000 DATA 76,79,75,72,77,76  
1010 DATA 74,79,81,75,80,83  
1020 DATA 80,77,70,68,65,65  
1030 DATA 65,67,76
```

Lines 1000-1030 contain the temperature readings which are READ into the array using lines 100-140. We then print out the information in a table, using lines 205-250 to also calculate the average daily temperature. Note also the use of a REM statement in line 90 to indentify our program. Months from now, this will help us remember what the program does.

Observe the use of descriptive variable names (DAY, READING, TOTAL, TEMP) to aid in following the program logic. Little things like this mean a lot in program development and readability.

We could easily have expanded our array to include a temperature reading each hour, or included wind speed and relative humidity readings. Only our imagination (and our weather station) limits us! Figure 1 shows the results of running this program. We have been able to input the desired information into an array and output it in a concise form, including a calculation of the average temperature.

FIGURE 1

	Temperature			
Day	6AM	12N	6PM	Avg.
1	76	79	75	76.66666666
2	72	77	76	75
3	74	79	81	78
4	75	80	83	79.33333333
5	80	77	70	75.66666666
6	68	65	65	66
7	65	67	76	69.33333333

This ends our brief exploration of numeric arrays. You may have noticed that we have avoided including the names of the players in our Little League example or the names of the days of the week in our temperature example. This is because your Atari treats information that uses the letters of the alphabet (known as "strings") quite differently than plain, vanilla numbers. Atari BASIC does not have the ability to work with arrays of strings. We can use other properties of Atari BASIC to simulate string arrays, but that is beyond the scope of this article. Rather than go into that here, we'll close this discussion with a summary of what we have learned so far about numeric arrays.

An array enables us to manage a number of variables by using one variable name. Arrays may be one- or two-dimensional and are created with statements of the form DIM ARRAY(X) for one-dimensional arrays or DIM ARRAY(X,Y) for two-dimensional arrays. The array size is one larger than the number used because the computer starts counting with zero. Array elements can be used in BASIC statements wherever a simple numeric variable can be used. With arrays we will often find it convenient to use FOR...NEXT loops to process all elements or a block of the elements.

Now go to it! You will undoubtedly find many uses for arrays in your own programming. Keep the rules in mind and the power and utility of arrays will be yours to command.

This article is based on the book Basic Atari BASIC, by James S. Coan and Richard Kushner, published by the Hayden Book Company, Hasbrouck Heights, NJ and available at bookstores and computer stores nationwide. It would make a wonderful Christmas or birthday present. The article is reprinted from "The Atari Explorer" magazine.

SOFTWARE SPECTRUM

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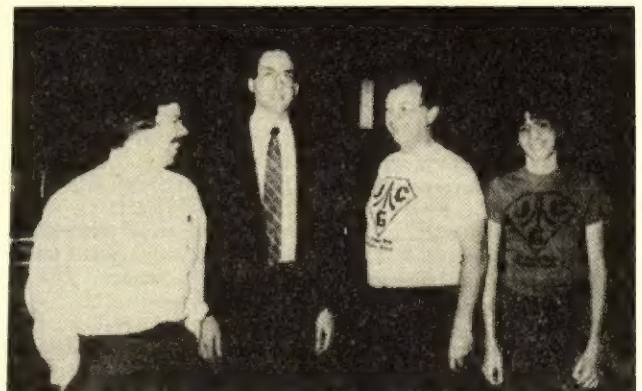
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SOFTWARE SPECTRUM

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Neil Harris (in suit) seems distracted from whatever is amusing to JACG President Art Leyenberger, Newsletter Editor Frank Pazel and VP Scott Brause. Harris, Publisher of The Atari Explorer, presented an interesting program featuring news on latest products plus demonstrations on the 5205T. See Meeting Highlights for details of his visit.

Photo courtesy Bob Whipple (JACS)

To Buy Or Not To Buy

by Donald Forbes - JACG

To buy or not to buy a new computer, that is the question. Whether 'tis nobler in the mind to suffer the slings and arrows of outrageous fortune, or to take arms against a sea of troubles, and by opposing end them?

My four choices: Do nothing. Spend \$1000 for the new Atari 520ST. Spend \$2000 for the forthcoming Commodore Amiga. Spend \$3000 for an IBM PC or clone. Each option has its GOOD and BAD points.

DO NOTHING

GOOD

I can save money. I can explore the 6502 assembler. I can explore Atari BASIC and PM graphics. Even today the price/performance ratio of the Atari 800 cannot be beaten. The machine is still a fine game machine as well as word processor for me, for my son's business, and for his and my daughter's college papers. Atari 800 Forth is in the public domain. I can explore Atari Forth (including valForth, QS Forth, Team and turboForth including floating point) and try to develop some marketable applications.

BAD

I will be falling behind on the technology. My Atari 800 with 8K of RAM for \$1000 and my EPSON MX80 printer were both announced in December of 1978. I will have nothing new to write about for the JACG newsletter and its knowledgeable readers. I will be unable to market my articles. I stand to lose my tax status as a part-time professional writer.

SPEND \$1000

GOOD

The new Atari 520ST has a mouse-controlled windowing environment, and good color graphics, well supported by the GEM operating system. It uses the Motorola 16-bit MC68000 chip, a fast 8 megahertz chip (developed from scratch as a good chip without downward compability).

Rod Coleman of Stride Micro in the latest BYTE says "...the 68000 is at least one generation ahead...in terms of microprocessor design...The folks at Motorola... started with a clean sheet of paper when they designed their 32-bit architecture with no concessions to an 8-bit past... Motorola simply wanted to build the best possible chip. By creating a totally new design with the 68000 they were also able to apply several new concepts... The 68000 was designed from the ground up to execute high-level languages..."

The JACG will support the machine (the members will continue to gravitate to a low cost machine with high performance characteristics). GEMINI will continue to support Atari. The machine will provide copy that Analog Computing or Antic may be willing to publish. The machine will give the benefits of a MAC with color at a much

lower cost and without the documentation and expansibility headaches of the MAC's closed-end architecture. A vendor version of Forth-83 for the 520ST with a GEM interface is available for \$150 from The Dragon Group, 148 Poca Fork Road, Elkview WV 25071 (304/965-5517).

BAD

Cost is one consideration. The machine has no expansion capabilities. To date there is only one version of Forth available, which is not in the public domain. Will the machine be reliable like my old Atari, with never a moment of down time and never a nickel for maintenance? Will there be complete hardware and software documentation like the old Atari? Will there be a cheap or public domain Forth for casual users?

SPEND \$2000

GOOD

The Amiga ("the next-generation Atari") will have the best graphics on the market, because Jay Miner's architecture will bring to 16-bit computing what he brought to 8-bit computing via the Atari 800. The Amiga 68000 chip runs at 8 megahertz and comes with 256K of memory. Commodore will be behind the machine, and Commodore is the third in the field of personal computers. (Datamation magazine's list of revenues of the top ten micro makers last year -- \$ millions: IBM 4000; Apple 1897; Commodore 1129; Hewlett-Packard 510; Sperry 503; Tandy 402; Convergent Technologies 361; Compaq 329; Olivetti 289; NEC 258.) The machine will provide food for articles, which will let me retain my tax status.

BAD

Cost is a meaningful consideration. The machine is not due until October. How much software will be available? Who will buy articles about the machine? Will there be a Forth, or even a free Forth? Will there be JACG support? Any user group support?

SPEND \$3000

GOOD

There is lots of software for the IBM PC (introduced in August of 1981) and its clones. My son may be able to tap this market with student self-teaching programs. There are many users, and a large magazine market. FRAMEWORK at \$350 is a flexible extensible business spreadsheet package. The Laxen and Perry public domain Forth -- F83 -- is the best there is.

BAD

The price is steep for a machine that costs the manufacturer \$700 to make, even though my \$3000 investment in the Atari a few years ago paid for itself threefold. The chip is an 8-bit chip in today's 16-bit chip world. The technology was outdated when the machine was announced. The 8088 8-bit chip (which had to be downward compatible) runs at a slow 4.7 megahertz. The graphics are

poor. I can run an IBM PC at work after hours, using public domain Forth. I can run Wang 8086 Forth with floating point at work after hours. The machine is designed for business applications instead of games and graphics. Is there any user group support?

CONCLUSION

Would it not be wonderful to enjoy the graphics of the Amiga at the price of the 520ST supported by a public domain Forth (like the FB3 for the IBM PC) that would be welcomed by the JACG membership, and to have Analog Computing and Antic magazines both clamoring for coverage? Perhaps next year? Or the next?? Or the next???

What Good Is MIDI?

by James Miller - JACG

The JACG newsletter was first to mention MIDI to many of us users and also gave us info on the Hybrid Arts interface for the 800 before the ANTIC article was published. Since my last article we're starting to hear more about MIDI. Unfortunately, it's the new design computers like Amiga and the ST that are addressing this development, leaving us 800 owners thinking about buying a new system. Regardless of the computer, it's time to think more about applications.

Some questions I've come across deal with controlling drum units from your synthesizer keyboard. Yes, individual drum sounds like snare, kick, toms, etc. only require one channel. Where the drums are layed out C-D-E-F-G-A-B on the keyboard. MIDI will address up to 16 channels simultaneously. But you are losing computer memory to drum data where it could have been used on synthesizer over-dubs. Many Drum units have their own memory for patterns and even entire songs. All you need from MIDI is a TRIGGER or timing pulse to keep all devices running at the same tempo. Synthesizers typically have small sequencing memory and are not designed to play songs from start to finish. So this is where you should put the computer to work for you.

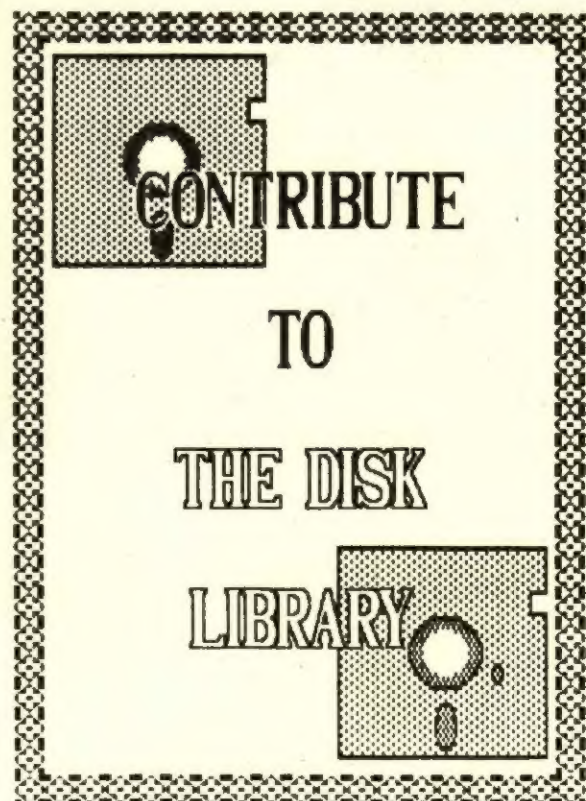
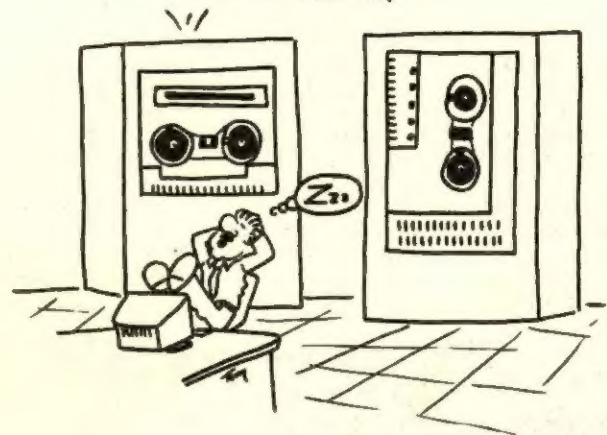
It seems reasonable to believe that future systems will incorporate MIDI buffers much like printer buffers that will allow the software the freedom to be more powerfull in editing during play. This allows for disk access time to replenish the buffer and room to incorporate windows. One window may monitor MIDI events and another window would be a word processor for writing lyrics concurrently. Then after a productive session the finished score complete with words can be printed out in sheet music form.

Another use of a MIDI buffer could be a high quality jam session over the modem with other musicians. Text would be mixed with MIDI data on your terminal. No more loading up the van with amps and going to rehearsal. Best of all, to "tear down" you need just to drop carrier and play back or maybe edit the final mix of the entire

session that your software was downloading to disk as your "Band" rehearsed. Then you print the sheet music.

Among some new products that are now available in music stores, is a MIDI device using a microphone or guitar as input. It analyzes and translates this analog input into digital MIDI event information output. You'll still need a synthesizer to provide the sound, but you don't have to learn keyboard to make it all happen. So to answer my first question 'what good is MIDI?', A: It could be real good, just hang in there.

"LET'S SEND HIM A PINK SLIP"

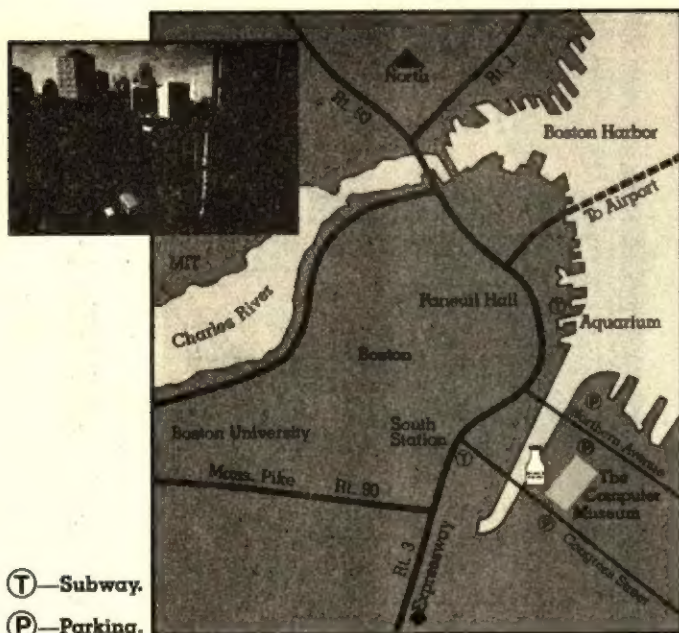


The Computer Museum

by Frank Pazel - JACG

If you are planning a trip to the Boston area you would surely enjoy a visit to the only dedicated computer museum in the world. Located within hailing distance of famous Quincy Market and the New England Aquarium it contains the most complete collection of computer memorabilia anywhere. As part of the continuing effort to renew downtown Boston and attract tourists the Computer Museum is housed in a refurbished warehouse shared by the Children's Museum, also a worthwhile visiting spot.

The address is 380 Congress Street. Any local can tell you how to find it if you ask to go to the "milk bottle", a gigantic 22,000 quart replica of a yesteryear's early morning clanker. Everything is right next door to the Beaver, the floating museum which commemorates the Boston Tea Party. General admission is \$4, \$2 for students and senior citizens. The museum is open from 11 a.m. to 6 p.m. Wednesday, Saturday and Sunday and 11 a.m. to 9 p.m. Thursday and Friday.



Housed on the fourth and fifth floor the museum is reached via a huge glass elevator which gives you a magnificent panorama of the bay. The collection is extensive and contains working computers of all kinds and pieces of almost every historical machine. There are samples of ENIAC, CRAY and state of the art IBM plasma thin screen systems. The history of computing from abacus through today is graphically displayed. You can sit down and try many displays including electronic painting, digitizing your face, and voice synthesizing. There are holographic displays of computer generated images, microscopic views of integrated circuit chips, interiors of space vehicles and just

plain lots of games and toys to try out. Sorry to report, there are no Ataris on display but I hassled the curator about it and maybe they will realize the error of their ways in due time.

Throughout the day there are lectures on a variety of computer related subjects and, as a topper, a fully stocked store which sells a unique selection of books, educational materials and gifts (such as IC jewelry).

Located in such a convenient spot, surrounded by so many other things to do, and at such a reasonable price, you would do well to consider making the Computer Museum a definite stop on your next visit to the Bean Town.

LORD DEMONFIRE

Sept. 27, 1985

Frank Pazel
14 Whitman Drive
Denville, NJ 07834

Mr. Pazel:

Cambridge, MA - Lord "Scoop" Demonfire here on location in Cambridge, location of Infocom's headquarters. Seems that Infocom has released a new science-fiction adventure entitled *A Mind Forever Voyaging*. But even more newsworthy is the inside information on the long-awaited sequel to *Burroughs*, now entitled *Spellbreaker*. Infocom seems to have been very hush-hush about this - in fact, when I talked to someone there, he claimed to know nothing about it (which may have been true), although I gleaned from an inside source the possibility of an early October release date. In this final adventure of the series, you are summoned to represent your Guild chapter in a Wizard's Conference at Borphes. It seems as if all the magic has been "vanishing." At the conference, however, all of the wizards are changed into neuter, excluding yourself. Your task is to find out what has been happening to the magic, destroy the evil being behind its disappearance (you should recognize him from an earlier adventure in the series), and restore magic to the land. All you have to go on is the shadowy assassin you followed from the Guild Hall at Borphes and the strange white cube he dropped when he disappeared. Although I myself have not played it, it promises to be one of the best (and most difficult) - it is rated at EXPERT Level! adventures Infocom has ever written. Stay tuned for more developments, and remember:

YOU SAW IT HERE FIRST!

Lord Demonfire



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COMPUTER RELATED VISION PROBLEMS

by Wm Schneider - JACG

Excerpts taken from articles in
Newark Star Ledger September 26, 1985
Somerset Messenger Gazette February 14, 1985

The University of California's School of Optometry has opened the first eye clinic specializing in problems associated with the use of video display terminals (VDTs). The main objective is to deal with the VDT's adverse effect on eye health and user productivity.

The clinic is supported by donations from AT&T and Westinghouse Electric Corp. Their concerns are the growing number of complaints of eyestrain, double vision, headaches and fatigue. This results in higher error rates and reduced speed and efficiency.

Patients are examined and asked to describe their workstations. This includes physical positions relative to the VDT's such as desk height and distance from the screen. Special attention is given to lighting, the patients sensitivity to glare, problems with eye movement and coordination and ability to focus on the screen.

According to Dr. William Moskowitz, a behavioral optometrist at 2 Park Avenue, Somerville, N.J.; "Even under the best working conditions at least half of VDT operators have complaints about vision related symptoms. They suffer headaches, eyestrain, blurred or double vision and even permanent vision problems." He cites the National Academy of Sciences report, "Video Displays, Work and Vision". Released in late 1984 it confirmed that VDT'S do not cause diseases or pathologies of the eyes. This report does state however, that people who already have vision problems, some of them very subtle, are very likely to experience vision-related complaints when using a VDT. Direct symptoms of VDT related vision problems are burning, itching, watery, pulling or irritated sensations of the eye, headaches, momentary blurred or double vision, or difficulty seeing clearly at distances after prolonged VDT work.

Dr. Moskowitz had the following observation; "In a sense we have Neanderthal vision for computer age work. Human vision developed to assure survival, to spot game, enemies, or opportunities at great distances." This disparity between our distance vision preference and the need to do near work is the main source of vision problems. The effort it takes to do near vision work is significantly greater than the effort required for distance work. It involves very complex eye aiming and the ability to use both eyes together, smoothly and simultaneously.

VDT users may require a change in their regular eye lens prescription or lens design or special lenses just for VDT use. People who wear glasses to clear their distance vision may find their prescription is

actually causing problems when they use a VDT. For most people, low power, focus-relaxing lenses prescribed specifically for their visual capabilities and for their own computer workstation can help. For people with certain visual skills problems, visual therapy may be beneficial to develop the skill and resilience needed for VDT work.

The following suggestions are intended for the workplace but can be applied to home usage as well.

1- The way the VDT workstation is arranged can have a big impact on vision complaints. Simple steps such as eliminating glare from the surroundings and reflections on the screen can help a lot. Adjust the brightness and contrast on the screen to obtain the clearest display possible.

2-Screens should be positioned so that workers can look at them as they would a typewriter. Place the screen so the operator can occasionally look up into a distant space instead of a nearby wall for visual relief breaks.


3- Choose software with dark characters on a light background. They are easier to discern.

4- When selecting a monitor, check for flicker and jitter. Also examine the text. Fuzzy-edged letters on a screen result in a constant effort by the eyes to clear up what wasn't clear to begin with.

By 1986 about 35 million Americans will work with VDTs as a daily part of their jobs. Although eye strain may appear to be an occupational hazard, many of us spend more time than we care to admit staring at a "tube" at home as well.

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by Joseph S. Kennedy - JACG

PDG - that might stand for "Pretty Darn Great" or "Public Domain Goods" - either one is appropriate for the JACG's Program Library - the subject of this column. By the time you are reading this, Halloween will be over and the Great Pumpkin will have come and gone for another year. But fear not! If you fell asleep out in the pumpkin patch while waiting for The Great Pumpkin, you can still find him on disk in Volume #014 (Graphics and Sound #2).

Before we look at any of the other programs, we should first take a look at Volume #008 (Games #5). In the September meeting Frank Pazel demoed a commercial version of Yahtzee converted to computer for the Atari. Well, right here in our Library, we have a version for the Atari that presents a game of Yahtzee that is true to the original in every sense. This version allows for three players and will even give you the Bronx cheer if you score a zero. After initially entering the number of players from the keyboard, the rest of this game is conveniently controlled by a joystick. The computer makes your first roll of the three rolls of the dice automatically. You then move the joystick to the right to select the number of the die (or dice) you wish to roll again and press the button to remove it. By pushing the joystick forward after all selections are finished the chosen dice roll again. If you are satisfied with the roll and do not wish to reroll any of the dice, then simply push the joystick forward until all three rolls are taken. After the third roll the program lists all possible plays available on the tote board. The selection of which score to take is again by joystick; this time you pull the joystick toward you to make the selection and press the button to register it. Give this version of Yahtzee a chance in your game time.

Besides graphics and games the Library also has educational programs. One of my favorites is the geography quiz on Volume #006 (Education #2). Geoquiz will guess the name of almost any country in the world that you think of by asking you a series of questions that require a "yes" or "no" answer. If you don't give what the programmer entered as the proper answer of course, the computer will never get your country right. (That's how I learned that rice is an important foodstuff in the Phillipines.) Of course to answer the computer's questions correctly you must know some world geography and social studies (Isn't that what they call painless learning?). This is also a cute program to show first time askers of that famous "What do you do with your computer?" question. This one amazes them everytime. Furthermore, since this is written entirely in BASIC you can easily list it, follow the logic through the program and change the questions to the ones your kids are presently studying in geography or social studies.

Well, that's a quick look at some of the programs in the JACG Program Library. I'll try to come up with a mix of games, graphics and education/business each month from the Library for your approval. If you have a special favorite please let me know and we'll include it here. Remember, as the new Atari says "power without the price"; computing does not have to be expensive. Many good public domain programs are as near as your user's group Library.

```
*****
*           J           *
* GIVE A BIT!! *
*           C           *
*           G           *
*****
```

Don't Be A TURKEY



Write An Article



EASTER EGG

Free Trip On The
Zinderneuf

If you finish a game and want to re-play, take the disk out of the drive and press START. The drive will come on and spin for a few seconds, then the game will start over with the same detective, victim, and killer!

Presidential Nominee Bill Martin

As the former President of an 800 plus member car club, I feel that I bring an expertise to the job of President of the JACG, that few others are capable of doing. When I was re-elected for my second (and final) term, I realized that the direction of such a large group (as is the JACG), was exhilarating and never a dull moment. Being the President can be a unique pleasure but it can also, (I well realize) be one pain in the rear.

My talents lie more in the administrative areas rather than those technical, but I have a strong desire to learn. My car club presidency was marked by numerous innovative ideas and the computerization of the clubs data base.

As far as personal facts, I'm 47, sometimes known as geezer on CIS, married and have a two year old son. He is actually the reason that I got into computers. I wanted to get a jump on him and have been an addict ever since. I've been employed for the past 24 years by a major airline and am in slow but steady pursuit of some courses in Computer Sciences. I am currently leader of a very small Atari Users group that is restricted to members of the car club.

The direction that I want to bring the JACG is toward learning. Art Leyenberger's question and answer period is, I feel a step forward. Unless a member is tied into CIS or has a knowledgeable friend, he is lost on a mountain of documentation. As another phase of learning, I would like to see the re-activation of the special interest groups (SIGS). I'm sure that there are others out there who would like to learn a first or second computer language. These groups were popular during the early days of the club and I feel that with the constant influx of new members, it is time to get them going again. I also believe that the members may want some social programs to open up avenues of personal growth. It's quite difficult for some people to strike up a conversation at the meetings due to the structured presentation. A social event or two per year would create positive interaction between members. Lastly, I want to double the size of membership. Not necessarily with local members that will take up space at the meetings but with absentee members from across the country who would be content with a newsletter and a membership card that may get them a discount at a dealer or two. At the car club, we found that the absentee members pay for a heck of a lot of fun for the active members.

My goals in general are no different from those of previous administrations. My predecessors have done an excellent job of putting us on the right track. Now is the logical time to grow stronger and learn.

I can be reached after 4:00P.M. daily at (201) 534 6349, but I usually have my answering machine turned on in case I'm changing a printer ribbon or diaper.

Lightning-Fast Forth

by Donald Forbes - JACG

How do you compare the speed of one micro with another?

The Sieve of Eratosthenes (find all the prime numbers between 2 and 8191 and repeat nine times) is a standard benchmark for micros.

The IBM PC/XT with an Intel 8088 chip running at 4.77 megahertz (cycles per second) can do it in 11.6 seconds. An IBM PC AT with an Intel 80286 chip at 4 MHz can do it in 3.71 seconds.

What runs it in only 0.339 seconds? You guessed it! Charles Moore's new chip with Forth embedded in the silicon.

For \$3,885 you can buy from Novix Inc. of Cupertino CA their Beta Board incorporating their NC4000P 8 MHz chip, hook it to the serial port of an IBM PC or compatible, and execute Forth code at speeds up to 8 million instructions per second.

According to computer expert Earle Jennings, the 0.339 second timing is for real: "That figure is not a typo...One thing immediately apparent about this device was that it was faster than anything else I had ever encountered...The NC4000 is screamingly fast..."

You can run up to eight concurrent tasks (a round robin multitasking feature) because the onboard hardware divides the stack memory region into eight segments. You can switch tasks in less than 5 microseconds.

The story goes back to October 1980 when John Peers, a robotics expert, was invited to join the board of Forth, Inc., which was founded a dozen years ago by Forth inventor Charles Moore. Don Colburn of Creative Solutions (they put Forth on the MAC) spent at \$1000 birthday present from his wife to investigate the merits of Forth on a chip and funded a one-day project organizing session with Charles Moore, Bill Ragsdale of the Forth Interest Group, and a chip design consultant. By March 1983 Chuck Moore demonstrated a color simulation of the processor.

By March of 1984 the Novix partnership commenced operation. It took four years and a million dollars to get to the detail design stage. It took seven months and seven hundred thousand dollars to put Moore's operational Forth processor on a chip.

This is not the first Forth chip, but it is certainly the fastest. Rockwell fit a good chunk of Forth into its R65F11 chip, along with the 6502 instruction set. The British Metaforth MF16LP single-board computer, which is implemented with custom bipolar circuits, uses Forth as its machine language. Bipolar technology is also incorporated in the H4TH/X Forth engines from Hartronix, which provide a real-time system with up to 4,000 primitives in firmware.

The press has begun to sit up and take notice. Electronic Design in their March 21, 1985 issue ran a story on "Fast processor chip takes its instructions directly from Forth." Novix reported that the "article put us on the map. Three hundred inquiries were developed. We found that Forth has friends throughout industry just waiting to show their management the opportunities." BYTE

for October devoted a half page to the Novix Beta-Board.

Next came Computer Language with a ten-page article by Earle Jennings on the architecture and hardware aspects of the chip announcing that "Language-on-a-chip technology creates new programming frontier." Jennings shows in great detail how the Forth virtual machine was converted into hardware: he covers the registers, pins, op codes, bit fields, data and return stacks and all the rest.

Then Dr. Dobb's Journal it its yearly Forth issue carried nine pages on "A Threaded-Code Microprocessor Bursts Forth: Subroutines Without Performance Anxiety" by Leo Brodie of "Starting Forth" fame.

Brodie writes: "What does all of this mean to the programmer? It is easily demonstrated that the NC4000 runs faster than conventional micros. Because Forth instructions execute in a single clock cycle, the chip runs Forth code about 100 times faster than Forth running on a conventional processor. A benchmark using the Sieve of Eratosthenes reveals that the NC4000 runs Forth over 10 times faster than the 68000 runs its own machine code...Future revisions will increase the speed considerably...The real wonder of the Novix chip is that it allows execution of an elegant, high-level, modular language directly in the logic of the CPU."

He notes that Charles Moore, the creator of Forth and chief architect of the NC4000 processor, has claimed that the Forth chip represents "a landmark in the evolution of hardware and software."

John Golden, the guiding light of Novix, is anxious to tell their story. The document on the "Novix 4000P Forth System" by Greg Bailey has lots of important information. The only reference material available covering code generation (which is quite good) is the 49-page preliminary edition of the "Programmer's Introduction to the Novix NC4000P Microprocessor" by Leo Brodie. Novix (408/996-9363) is at 10590 N. Tantau Ave. in Cupertino CA 95014.

What next? Earle Jennings observes: "This the first time I have ever encountered a new machine architecture where there are already over 10,000 systems programmers proficient in its assembly language and able to develop code on everything from a VAX computer to a Commodore 64."

PEEKS AND POKES

by Kenneth J. Pietrucha - JAC6

By now most of you are familiar with the Basic sound command SO.C,T,D,V. C is the channel that you want to turn on and is a number between 0 and 3 (four channels). The T stands for the tone or note we want to hear and is a number between 0 and 255. D controls our distortion level and is an even number between 0 and 14 (only the numbers 10 and 14 give a pure tone). Volume is controlled by a number between 0 and 15, where 15 is full volume. If you type the statement SO.0,100,10,15 and hit return, you will hear a tone which will not turn off until you cancel it with the statement SO.0,0,0,0.

We can get the same results by poking certain locations. Once again we have four channels, only this time they are selected by Poking an even location between 53760 and 53766 with the tone number between 0 and 255. Note that 53760 corresponds to channel 0, while 53766 is for channel 3. A Poke 53760,100 causes the same note to sound from channel 0 as the Basic sound command.

Before we get sound we must set our distortion and volume level. This information is poked into the odd numbered locations between 53761 and 53767, with the lowest location for channel 0.

The number to Poke for distortion and volume in our example must be calculated by the following relationship $(16 \times \text{Distortion}) + \text{Volume}$. For a distortion of 10 (Pure Tone) and full volume of 15, the number to be poked in location 53761 is $(16 \times 10) + 15$ or 175.

The basic command SO.0,100,10,15 can be duplicated with a POKE 53760,100:POKE 53761,175. To turn the sound off, set the volume back to 0 with a POKE 53761,160 with the 160 being equal to $(16 \times 10) + 0$.

If you wanted the same results from channel 3 (really the fourth channel), you would Poke registers 53766 and 53767. It's really pretty simple and much easier to use than the Basic sound command.

If you enjoy good music, you will soon discover that some of the notes generated by the Atari are a few cents short of a dollar.

In a future column I'll show you how to combine two channels for double precision sound.

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RAMROD XL MOD

by R Mulhearn - JACG

If you have an 800 XL and have installed the RAMROD XL board, here is a modification to make it both easier to use and more reliable. I needed to come up with this mod not only to mate my modified 800XL to my new XL-EXPANDER but also to replace the switch that came with the RAMROD that had become erratic and unreliable in switching between my three operating systems. The switch supplied with the RAMROD is special and not easily obtainable. This mod permits the use of an ordinary SPDT center off switch and further allows the possibility of software commands doing the switching.

You will need a soldering iron with rosin core solder, two 4.7K 1/2W resistors, an Xacto Knife, a 16 pin IC socket, a 74LS138 IC, a miniature or subminiature SPDT center off switch, 2' of stranded 22ga wire and last some solderable insulation wire such as put out by VECTOR ELECTRONICS. Refer back to the instructions that came with your RAMROD to disassemble the 800XL. Remove the RAMROD XL board from the 800XL motherboard and put aside the 800XL for now as all modifications are done to the RAMROD board. To be on the safe side remove whatever chips that you have installed on the board VERY CAREFULLY. Note how the chips were installed by the notch at one end so that they may later be returned correctly.

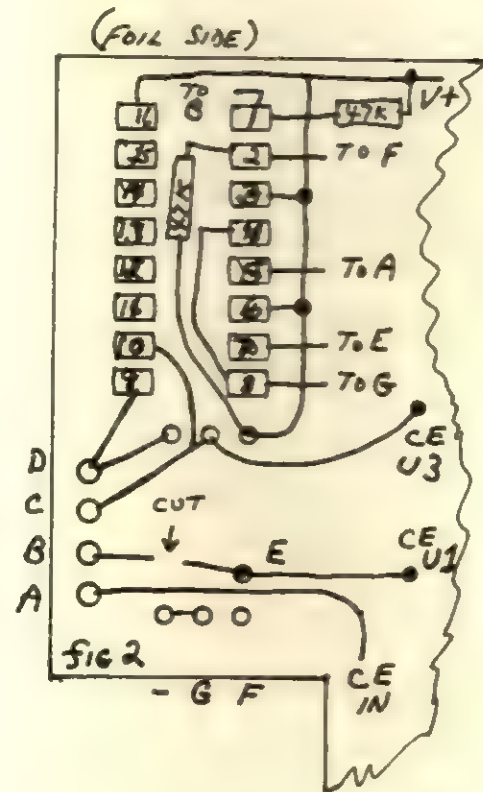
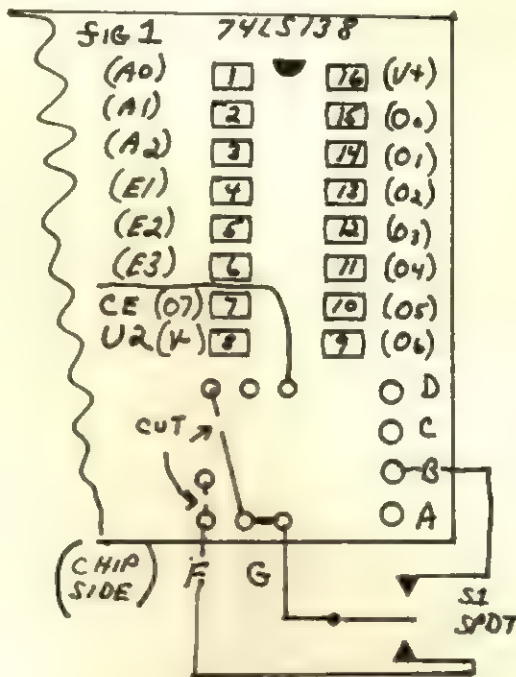
With your Xacto Knife cut the three PC traces as per FIG 1 and 2. Solder the 16pin socket in the space provided on the board, carefully note that the notch or pin 1 side of the socket matches FIG 1. Next referring to FIG 2, add the two 4.7K resistors, and using the "solderable" wire add the jumpers of pin 9 to D, pin 10 to C, pin 8 to pin 4 and pins 3 and 6 to the V+ line running alongside the socket. At this point stop and check your progress. Next connect pin 1 to B, pin 2 to F, pin 5 to A, pin 7 to E and pin 8 to G. Last attach three lengths of 22ga wire of suitable size for your switch mounting location to the switch and the board as per FIG 1.

The labels in () in FIG 1 are the 74LS138 pin labels. The truth table for operation of this circuit is as follows:

E1	E2	E3	A0	A1	A2	O5	O6	O7
L	L	CS	L	L	L	L	L	L
L	H	OFF	L	L	L	L	L	L
L	L	L	L	L	L	L	L	L

As can be seen whenever E2 is low the operating system chip can be selected. This signal comes from the 800XL and is unchanged and is normally low. This bit is switched high to disable the operating system; you must provide your own control which is no easy task. The lines connected to our switch are labeled A0, A1, and A2. A2 we tied high while A0 and A1 are pulled high by the 4.7K resistors when the switch is off. When the switch is at either extreme, either A0 or A1 is low. As can be seen from the above table, when all A inputs are high output 7 is low and U1 is selected. If A0 is low then output 6 is selected and U2 is enabled. If A1 is low then output 5 is low with U3 being selected.

Remount your switch so you will know what is selected, and put your chips back in. Reassemble your XL and test that the system performs as expected. If you added an OR logic circuit and also connected the A inputs to the PIA 6520 unused ports in the XL by way of it, then with a machine language program you might by a simple key press change the operating system. Better yet a subroutine might change the system automatically, no more translator to load; the system would boot till it received a good load flag.



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TIC TAC TOE

by Kenneth J. Pietrucha - JACG

TIT, TAT, TOE, MY FIRST GO.
THREE JOLLY BUTCHER BOYS, ALL IN A ROW.
STICK ONE UP, STICK ONE DOWN.
STICK ONE IN THE OLD MAN'S CROWN.

"OXFORD DICTIONARY OF MOTHER GOOSE RHYMES",
1951, PG. 406

This nursery rhyme illustrates one of the many variations in spelling the name of a simple game known to many of us as tic-tac-toe. It is popular with children because of its simple basic patterns, which can be mastered quickly. In addition, it is played with what is referred to as perfect information. This means that both sides see each other's moves, thereby removing much of the element of chance. Because of this, the game must end in a draw unless one of the players is "asleep at the switch".

The movie War Games illustrated this point very nicely. The computer wanted to play a "for real" game of thermo nuclear war. The computer, which did not understand reality, had to be fooled into thinking that no one wins in playing games. To bring this point across the computer was invited to play tic-tac-toe. After many games, the computer realized playing games was no fun. No one could win and every game ended in a draw. The computer then released its control of the missals.

Although the game is simple to learn, there are (9x8x7x6x5x4) or 60,480 possible moves in the first six plays. Teaching your computer to play this game so that the game always ends in a draw, can be quite a formidable task.

The late Charles Babbage, a 19th. century inventor, was supposed to have invented the first TTT Robot. He planned to exhibit it in London to raise money for his work. It appears he never built the robot and he left no record of this machine. He claimed it kept a running total of the games it won and used this information as strategy in other games. If you have read anything about Babbage, you will realize it was entirely possible that he had at least the plans for such a machine. A little insight into this great man can be found in the book Life of a Philosopher.

Another classic you may have had to endure in school was Ovid's Art of Love, in which he included "tic-tac-toe" among those games a woman was advised to learn in order to be popular with men. (How times have changed !)

There are many variations of this game. In about 1300, in "Jolly Old" England, the game was popular and known as "Three Men's Morris", with variations of 9, 11, and 12 Men's Morris. In the United states we played a variation known as "Mill". There are other variations that you will find in computer game books and magazines with names such as "Jam" and "Hot".

The JACG Club Library has a TTT game on disk # 44. I have played the game and have won. So, as far as artificial intelligence goes, it still needs a little work.

If you ever find a game of TTT that always ends in a draw let me know, I'd love to see its algorithm.

```
*****
*****
***          ***
*** 00000 000 0000 00000 ***
*** 00000 00000 0000 00000 ***
***  00  00 00  00  00 ***
***  00  00000 00  00 000 ***
*** 00 00 00000 00  00 000 ***
*** 00000 00 00 00000 00000 ***
***  00  00 00  000  00000 ***
***          ***
***          ***
*** BULLETIN BOARD ***
***          ***
*** 24 HOURS/DAY ***
***          ***
*** 201-549-7591 ***
***          ***
*****
*****
```

Answers to
Do You Know?

ST stands for Sixteen/Thirty-two. The chip used in the machine is a Motorola 68000 which is a sixteen/thirty-two bit chip. XE stands for XL Extended. The machine is XL compatible but with extended features.



"ALRIGHT! I'LL NEVER TOUCH YOU THERE AGAIN!
I PROMISE !!"

HAVE YOU RENEWED
YOUR MEMBERSHIP?

CHECK YOUR MAILING LABEL
FOR MEMBERSHIP EXPIRATION DATE

DISKTOOL

A GRAPHIC ADVENTURE THROUGH SECTORLAND

by Wm Schneider - JACG

Have you ever deleted a file only to discover that it was the wrong one or one you should have kept it? Or attempted to delete all filename extensions, using the wildcard function, and ended up with a directory full of the same filenames? I have done both on more than one occasion. The subsequent Richard Pryor impersonation hasn't restored any of these files, but Disktool has. Disktool (revision 3) by Tony Messina appears in the ANALOG Compendium. It is the best magazine program I have used.

Attempting to enter this hidden world of disk sectors armed with novice status can be frustrating. Anyone who has read technical practices can appreciate the fact that you can go only so far before you have to refer to other sources in order to understand what you just read. The intent here is to provide a "Readers Digest" version of the ANALOG article.

Before proceeding it must be noted that Disktool only works with DOS 2 or 2.5 in single density. Also if a disk has been re-formatted, over existing files, forget it. The formatting process creates 720 sectors on the disk and writes zeros to them, forever erasing the previous information.

Using the DOS function A with a newly formatted disk returns a value of 707 free sectors, not 720. The 13 "missing" sectors are reserved for bookkeeping. Sectors #361 to 368 are used for the disk directory. These are the filenames which appear with the DOS A function. Sector #368 is called the VTOC (Volume Table of Contents). It keeps track of which sectors are in use. Sectors #1 to 3 are the boot portion of the FMS (File Management System). They are the sectors initially read at power up. Sector #720 is not accessible to DOS due to an inherent bug.

The best way to get familiar with Disktool is to use it. Before loading it, find a disk with some text files and make a duplicate copy. Disktool consists of 3 separate program files. It takes about 1 minute to load so don't remove the disk until you see the menu screen. This screen lists the various functions. It can be accessed at any time by typing H (Help).

Hit D (directory) and you are presented with a list of the filenames (including extensions). The corresponding file number, starting sector (the first sector that this file appears at), file length (total number of sectors) and the directory sector (361-368) this file appears on is also listed.

At this point, a confusing aspect appears; the Hexadecimal codes. Decimal to Hexadecimal code conversations are required to make certain changes with this program. However this is simplified with a conversion listing or by manipulating the program

itself into giving you the necessary numbers. At the bottom of the screen the current sector number is listed in both codes. By simply typing the number in question, you are taken to the corresponding sector number where both the Decimal and Hexadecimal numbers are listed.

After examining the directory listing go to Sector 361 and compare that display. Each directory sector lists up to 8 filenames using 2 lines for each. Information for each file is similar to the Directory printout but in a different format. The following lines are examples taken from the Disktool disk directory.

```
>$40 42 71 00 AA 00 44 53 4B
Bq.z.DSK
>$48 54 4F 4F 4C 20 50 54 32
TOOL PT2
```

\$40 =the first byte number of the 8 bytes on the line. This line contains bytes #64 to 71. DOS numbers these bytes from 0 to 127, not 1 to 128.

42 =the file status code.

71 00 =the length of the file (\$0071 is equal to 113).

AA 00 =the starting sector number (\$00AA is equal to 170).

Note that the last two items were written "in reverse" with the \$ ignored.

44 53 4B =the first 3 letters of the filename. Look at the right-most side of the line and the equivalent DSK are given. The next line is a continuation of the filename, including the extension name. 54 is T, 4F is O, etc.

To examine an individual sector just type the sector number when prompted. The sector display is divided into two parts. The left side is an 8 by 16 matrix containing the 128 hex bytes that are stored on each sector. The right side displays the ATASCII equivalent of these hex bytes. Of these 128 hex bytes, the first 125 contain actual program data. The last 3 bytes contain sector identity data (link data). A dot on the ATASCII table means the corresponding data byte is non printing. The bottom of the screen lists the current sector number (in Decimal and Hexadecimal), file number and the next sector number that this file continues on. A zero at this point signifies the end of a file.

This is the magic formula for restoring damaged files. An Error 164 indicates a file link error. In other words, Sector 456 may be File #5 and give Sector #457 as the next sector. However Sector #457 may be listed as File #7. This is where the adventure begins. You will have to determine where sector #457 belongs. Only experience will dictate the best way to accomplish this. However by using the Trace function for the other files on this disk you can determine which files are undamaged and the sectors they occupy. By the process of elimination the file link structure can be calculated. If your disk has had any file deletions and additions you may find files with sectors all over the disk.

If a sector is physically damaged, indicated by Error #144, you will be able to bypass this sector and save most of your file. Of course this information must be retyped to restore the original file. This will be possible with BASIC or text files only. After the proper link data is determined use the Modify Command and follow the prompts. If the specific information is not changing, just hit Return.

Another command is Change. This is used when the start sector or total number of sectors on the disk directory sector is incorrect. The hex bytes on the left of the matrix are used for this function. The corresponding values on the right are changed automatically.

After Modifying or Changing a sector the Write command must be used to change the disk itself. This command must be used cautiously.

The other commands on the main menu are self explanatory. The Restore command may not work if the disk has had new files written to it after the file deletion. DOS uses free sectors before reusing sectors from a deleted file. So depending on the number of existing free sectors at least part of your file may be saved with additional work. Miscellaneous items; don't use the Trace command when you are on the Help screen or it will scroll. Also the Print command seems slow.

Besides mental lapses I have been given various reasons why disks go bad. I cannot support their validity but they somewhat make sense. Never turn off the disk drive with a disk still inserted, always write DOS to the disk before adding any other files, don't use disks formatted on a Percom drive, never remove a disk from a 1050 before the light goes out and use a surge protector.

Disktool should be part of everyone's library. It has saved me hours of retyping crashed files and produced a sense of accomplishment. See the club disk librarian if you would like a copy of this powerful program.

PAY ATTENTION!



**IT'S TIME TO GIVE
A BIT**



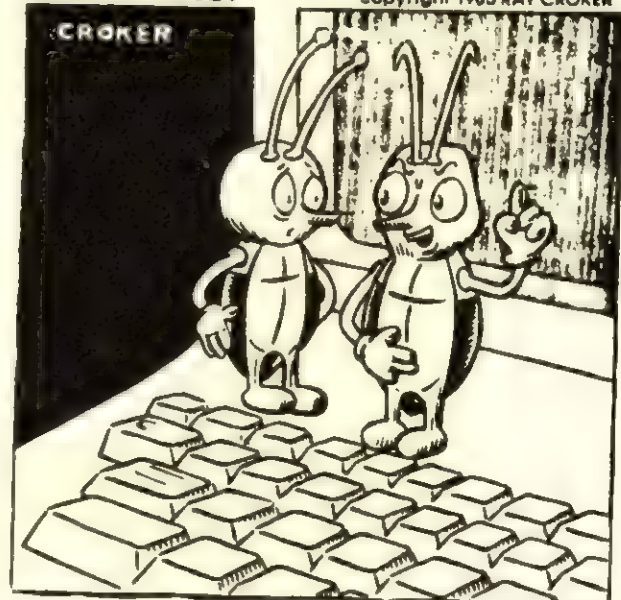
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1. All flea market sellers must be current JACG members.
2. Space is provided on a first-come, first-served basis.
3. Only ORIGINAL programs with ORIGINAL documentation may be sold in the area of software.
4. Hardware of any type may be sold normally without constraint. The Executive Committee reserves the right, however, to limit the physical size and space consumed by such hardware.
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Do You Know?
Modestor (CA) Atari Computer Club

What the **ST** stands for on the new Atari computers?

1. Sam Tramiel
2. Super Turbo
3. Sixteen thirty-two
4. ???

What the **XE** stands for on the 130?

1. Xtra Everything
2. XL Extended
3. XLS for Everyone
4. ???

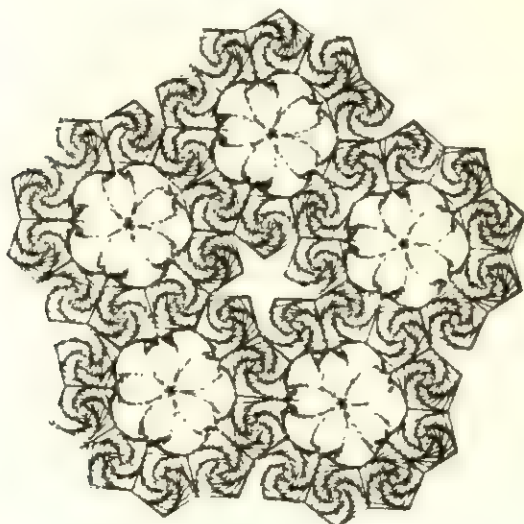
Answers on Page 19.



EASTER EGG

Q*bert Away!

Send Q*bert into space without a disk! On the first screen, hop down four squares on the right side, then hop onto the disk. As soon as it turns yellow from Q*bert's touch pause the game and start over. Keep pressing the hop button. When he's just about to appear move the joystick to the right. When Q*bert jumps two squares down to the right immediately move him back to the first square he landed on (not the one he appeared on), then jump to the middle square and change colors of the other squares opposite the right side. Then hop to the top square and jump off into space. If you have done this correctly and kept your finger on the fire button at all times you should land on the "invisible pyramid." How could anything be simpler (?).



New Math Titles
(Or Much Ado About Nothing)
From SIAM News

Distance Lends Enchantment -- Applications of Metric Spaces.

NCB's New Fall Line-Up -- An Overview of Dynamic Programming.

Shake Well Before Using -- An Introduction to Perturbation Theory.

But I am as Constant as the Morning Star -- A Compendium of Fixed Point Theorems.

All's Well That Ends Well -- A History of the Four-Color Theorem.

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**Bulletin Board
For Forth**

From Steve Calfee
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San Jose, CA 95133

Have started a turbo-4th BBS evenings (8 PM to 8 AM) & weekends (8 PM Fri to 8 AM Mon). Phone 408/272-0330. Use password from disk & manual -- the 3rd string, not your name. Use for questions to me and others, & to up and download public domain programs. BBS has several utilities, floating point package, & turbo-4th terminal program that includes the XMODEM communication protocol. Hope it will be useful.

Kushner Demos Forth (Part One of Three)

by Donald Forbes - JACG

No amateur is better equipped to present the Atari to other amateurs than Richard Kushner. Armed with a doctorate in chemical engineering, he does basic research on advanced semiconductor process control for Bell Telephone Labs in Murray Hill, NJ. In November 1981 he founded the Jersey Atari Computer Group and became editor of its monthly newsletter.

When he stepped down as president three years later the group had 550 members that filled the cavernous Bell Labs auditorium from month to month, the best monthly (28-page) newsletter in the country, a huge software library, an unmatched bulletin board, and \$8,000 in the kitty.

When the Hayden Book Company needed a book on Atari BASIC, they put him in touch with James S. Coan who had previously written two books for them ('Basic BASIC' and 'Advanced BASIC') followed later by books on BASIC for the Apple and Commodore 64. Dick was determined to do the job right. This book would not be a pale copy of Basic for the Brand-X computer. The result was 'Basic Atari BASIC,' a complete guide to BASIC on the Atari.

Dick is not a FORTH programmer. We can only speculate on what kind of a demonstration he might stage for a FORTH audience. Here is one scenario, based on observations of his performances over a two-year period. His mastery of the Atari translated into FORTH will allow you to stage an imposing exhibit of the strong points of the Atari computer in data handling as well as its sound and graphics capabilities.

Data handling

We begin with the basics in an elementary introduction:

```
: FIRST-PROGRAM
```

```
CR ." Here is an example "  
CR ." of a program "  
CR ." in Atari Forth." ;
```

The average of six numbers can be calculated with this program:

```
: AVERAGE
```

```
36 45 65 89 91 56  
+ + + + + 6 / .  
." Average " ;
```

You can use a reverse slash to insert comments in your program with this code, which causes the compiler to skip the rest of the line:

```
: \ ( skip rest of line )  
IN @ 32 / 1+ 32 * IN ! ;  
IMMEDIATE
```

so that you can do this

```
: COMPUTERS \ Reverse slash comment  
\ This is all about computers  
." This is all about computers" ;
```

Suppose we have a record of gasoline purchases for a brand-new car. This program will calculate the mileage for each tankful of gasoline.

```
O VARIABLE MILEAGE1  
O VARIABLE MILEAGE2  
O VARIABLE GALLONS
```

```
: #IN CR ." ? " QUERY 1 WORD  
HERE NUMBER DROP ;
```

```
: GAS-MILEAGE ." First reading "  
#IN \ Input mileage1  
MILEAGE1 ! CR BEGIN CR  
." Gals " #IN \ Input gallons  
GALLONS ! ." Mileage "  
IN# \ Input mileage2  
MILEAGE2 ! MILEAGE2 @ MILEAGE1  
@ - GALLONS @ / . ." mpg "  
MILEAGE2 @ MILEAGE1 !  
O UNTIL ;
```

Note that the word #IN works for signed integers like the INPUT statement in BASIC.

Suppose we wished to run the same program with stored data, rather than data entered from the keyboard. Then we can use this variation:

```
O VARIABLE MILEAGE1  
O VARIABLE MILEAGE2  
O VARIABLE GALLONS  
: #IN CR ." ? " QUERY 1 WORD  
HERE NUMBER DROP ;
```

```
DECIMAL 2303 VARIABLE DATA
```

```
127 , 4567 , 177 , 7094 ,  
111 , 8955 , 138 , 11316 ,
```

```
: GET-GALLONS 4 * 2 +
```

```
DATA + @ GALLONS ! ;
```

```
: GET-MILEAGE2 4 * 4 +
```

```
DATA + @ MILEAGE2 ! ;
```

```
: MILES-PER-GALLON
```

```
DATA @
```

```
MILEAGE1 ! \ Input mileage1
```

```
4 O DO
```

```
I GET-GALLONS \ Input gallons
```

```
I GET-MILEAGE2 \ Mileage2
```

```
MILEAGE2 @ MILEAGE1 @ -
```

```
GALLONS @ / CR ." Mpg " .
```

```
MILEAGE2 @ MILEAGE1 ! LOOP ;
```

To count numbers with a display, this program will work.

```
: COUNT-WITH-DISPLAY
```

```
O BEGIN 1 + DUP . AGAIN ;
```

To count to seven with a display we can use

```
: COUNT-TO-SEVEN
```

```
O BEGIN DUP 7 < IF I +
```

```
DUP . THEN AGAIN ;
```

Suppose we have a relative who has promised to give us five times our age in dollars on each of our first twentyone birthdays. This problem can be solved with the logic of the counting program.

```
: BIRTHDAY-DOLLARS
```

```
." Total of $5 for each year "
```

```
CR ." on each birthday "
```

```
O 22 1 DO I 5 * + LOOP
```

```
CR ." $" 4 .R
```

```
." after 21 years" ;
```

Here is another counting problem. You are the quality control inspector in a packaging plant and the average weight for five packages selected at random must be at least 180 grams. You want to write a program to ask the right questions and then accept the lot or reject it.

```
O VARIABLE TOTAL
```

```
O VARIABLE COUNTER
```

```
O VARIABLE WEIGHT
```

```
: #IN CR ." ? " QUERY 1 WORD
```

```
HERE NUMBER DROP ;
```

```
: PACKAGE-WEIGHT-MONITOR
```

```
O TOTAL ! 1 COUNTER !
```

```
5 O DO ." Weight " I 1 + .
```

```
#IN \ Weight
```

```
TOTAL +! 1 COUNTER +! LOOP
```

```
TOTAL 5 / 180 < IF
```

```
." Reject this lot " ELSE
```

```
." Accept this lot " THEN ;
```


How do they get the computer to flip coins, deal cards or roll dice? All we need is the ability to generate numbers at random. Here is a way to generate ten random numbers. This program takes advantage of the fact that the Atari hardware generates a random number at byte 53770 in memory.

```
0 VARIABLE RND
53770 @ RND !
: RANDOM RND @ 31421 * 6972 +
  DUP RND ! ;
: RND# ( n1 - n2 )
  RANDOM U* SWAP DROP ;
: TEN-RANDOM-NUMBERS
  10 0 DO
    10000 RND# CR 5 .R LOOP ;
```

We can now flip a coin 38 times which will just fill one line of the screen.

```
: RND# ( n1 - n2 ) 53770 @ SWAP
  /MOD DROP ;
: FLIP-COIN-38-TIMES
  38 0 DO
    100 RND# 50 > IF
      ." T" ELSE
      ." H" THEN LOOP ;
```

To roll a die ten times we can generate a random number less than 60 and then divide it by ten to choose the face.

```
: ROLL-A-DIE ( ten times )
  10 0 DO
    60 RND# CR DUP 5 .R
    5 SPACES 10 / 1 + . LOOP ;
```

Any program that requires input from the user is open to 'crashing' if the user inputs information that the program will not accept. Here is a way to protect the program against incorrect input.

```
: INPUT-PROTECTION BEGIN
  ." Pick a number from 1 to 20"
  #IN DUP DUP 1 < SWAP
  20 > OR CR IF
  ." Invalid input. Try again "
  ELSE ." Good guess! "
  ." That's my number too. "
  THEN 0 UNTIL ;
```

(Part two next month.)



ORNJUICE
Atari Computer Assoc. of Orange Co. (CA)

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Remember, receiving the JACG Newsletter is just one of the many benefits of being a member of JACG.



"GEE DAD, NOW THAT I'VE MASTERED CHAMPIONSHIP LODE RUNNER.... LIFE JUST DOESN'T SEEM TO HAVE ANY MEANING."

The J.A.C.G
WANTS



YOUR
ARTICLE

1050 READ/WRITE SWITCH MOD

by L.Kelley (SMLACE)
additional by R. Mulhearn - JACG

If you have a 1050 drive, then throw away your nibble notcher or hole punch. Here is a quick and easy way to add a switch to fool the drive into acting as you wish. First NOTE that any modifications to your drive will most likely void your warranty; wait until it expires before doing the modification. Also misuse could be FATAL to the life of your program. Backup whenever possible.

By adding a 3PDT center off switch you can write, write-protect or retain normal operation, and with a dual color LED always know which mode you are in. Before you start, collect your tools and parts that you will need for the modification. The switch can be any miniature or sub mini 3PDT center off switch. The max size that will fit in the case is about .7" by .5"; the smaller the greater the cost. The LED is an LINROSE ELEC. ID1 unit #B4381H1/5. One source for both is Lashins in Denville, Radio Shack doesn't carry them, although any well stocked electronics store should have no difficulty. Also pick up a 1/2W 680-820 ohm resistor. You will need a phillips screwdriver, a 25 watt soldering iron, a length of fine gauge rosin core solder, wire stripper, 3" of 1/16" shrink tubing, and about 3' of 22 or 24 gauge stranded wire.

Turn the 1050 drive bottom side up and remove the four screws holding the top and bottom together. Also remove the two screws holding the front cover on. Now turn the drive right side up; carefully pull the top cover off by pulling up at the back and rocking it loose at the front (as if it were hinged on the front). Go slow! DO NOT FORCE IT! For now put the front BEZEL aside. Looking down at the drive mechanism from the top front, the write protect wires to be tapped into are on the left side top at the very front. There are five white wires, three to the switch on the door handle and two to the photo-sensor. These last two are the ones that we want. Carefully cut the tie wraps that bundle the wires together and double check that you have the two correct wires. Pick either one and cut it about 2" from the sensor, strip the ends 3/8". Take a 5" length of your 24ga wire also stripped 3/8" and a 1" length the shrink tubing (in a pinch you can use electrical tape). Feed the sensor end and the stripped end of the 5" wire thru the shrink tubing (push the tubing back 1". Solder all three ends together so that the tubing will still slip over the joint. Heat the tubing to shrink it to a tight fit. The other end of the 5" wire mark as sensor lead A. Now take the other sensor wire and cut it again about 2" from the sensor. Take two 5" pieces of the 24ga stripped 3/8" and join one to each end of that second cut sensor wire. Again cover the joint with shrink tubing and heat. Mark the wire going to the sensor as lead B and the lead going back to the electronics as lead C. For now put the main mechanism down while we mount and wire the switch and LED.

Take the front BEZEL and choose where to mount your switch and LED. It will depend a lot on the size of your switch. I mounted mine on the left side of the BEZEL front. To do so required that I grind part of a molded rib flat so that the switch and LED would sit flat. Wherever you mount the switch MAKE SURE that you can put the cover back on. Both the LED mounting lens and switch bushing hole should be a snug fit. It helps to mount the LED as close as possible to the switch.

Wire the switch as per FIG 1. To keep things neat twist the two 10" lengths together. Wire the two free ends of the 10" lengths as per fig 2. It doesn't matter which end goes where yet. At this point ALL wires should be attached. Double check your work. Check especially for stray wire ends or excess solder shorting two positions. Now for a quick check before reassembly. With the switch in the center position, plug the power line back in and turn the drive on. The LED should NOT light. Next flip the switch up all the way and then down all the way, the LED should light green then red. Wired as per Fig 1, down the LED should be red and you should be able to WRITE TO ANY DISK, center the LED is off and you CANNOT WRITE to a disk while up the LED is green and conditions are NORMAL as if no switch was in place. If the colors are wrong or you do not prefer that combination simply reverse the two ends of the 10" leads B1 and B2 and/or sensor leads A and B.

If everything is working right to this point, turn the unit off and carefully screw the top and front BEZEL back on. Put the drive back in your system. Load up DOS and verify that the switch performs as you expect. A schematic of the mod is shown in Fig 3. If you don't want or need the LED you can substitute a SPDT center off switch; just wire it as per Fig 1 sensor section only.

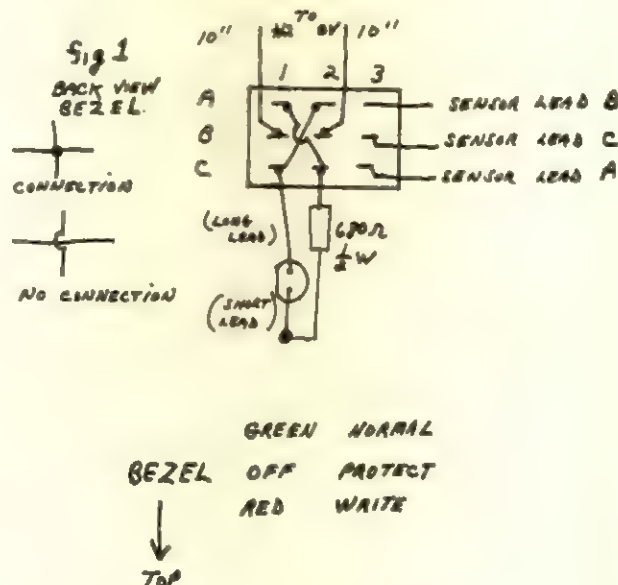


Fig 2
!CAUTION!
POWER DISCONNECTED

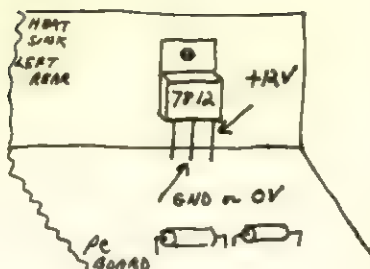
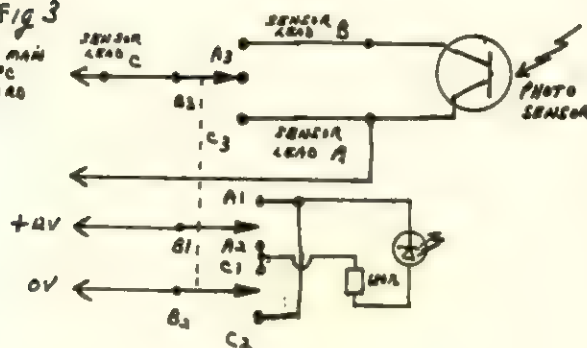


Fig 3
TO MAIN
PC
BOARD



Where's **YOUR** article?

*
* **GIVE A BIZ!** *
*

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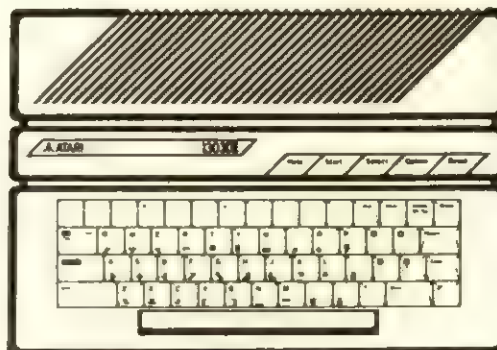
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Writing For The JACB Newsletter *****

Articles should be submitted to the Editor by the 28th of the month for inclusion in the next issue. Submissions preferred on disk, using LJK Letter Perfect or Atari Writer. Font style should be Elite or Proportional with right hand justification. If hard copy is submitted the final printed width should be 4-1/4 inches from left margin to right margin. All formats will be considered including hand written documents if first arranged with the Editor.

We want to encourage everyone to voice his/her thoughts, knowledge, and opinions. Writing will be modified at the discretion of the Editor. No piece will be knowingly altered out of original intent.



Mathematics Of Mathematics (1)

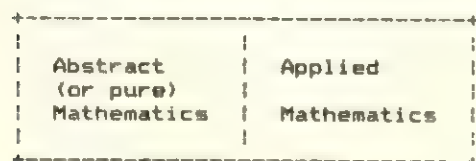
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If you would master mathematics, the language of science and the apotheosis of our culture, you must strive to be a mathematician's mathematician.

You will need to master the conceptual structure of the mathematical sciences in general, and of abstract mathematics in particular.

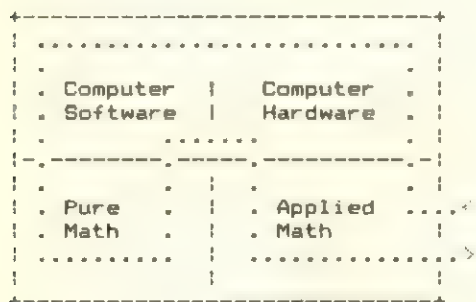
Until 1950 the conceptual structure of the mathematical sciences could be represented simply as a rectangular black box, with the left half representing abstract (or pure) mathematics, and the right half applied mathematics. The user with a problem invoked the applied mathematician who in turn invoked an algorithm provided by the abstract mathematician which returned the answer to the applied mathematician. He, in turn, supplied the solution to the user.

Note that in this model the left and right halves served as mirror images of one another, like the obverse and reverse of a coin. Duality pervades most of mathematics; a theorem can usually be viewed from two aspects.



Installation in 1950 of the first commercial computer made this model obsolete. The two part rectangle became a rectangle with four quadrants, with computer hardware in the first quadrant, computer software in the second quadrant, abstract mathematics in the third and applied mathematics in the fourth.

The path of problem solution now moved from the applied mathematician to the computer hardware to the computer software to the abstract mathematical algorithm and back to the problem proposer. In this extended model, the vertical axis became the axis of applications about which the two halves were mirrored, and the horizontal axis the axis of computers, about which computer software and hardware mirrored the mathematical structures.



These models are fundamental to this investigation. The art and science of mathematics consists of building models which can be applied in other contexts. This

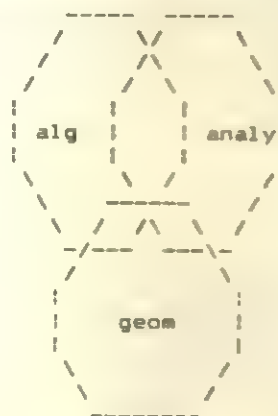
inquiry uses mathematical models to build an overall model of the mathematical sciences as one integrated unit, and then uses analysis and synthesis to break down the components and reassemble them into a coherent and comprehensible structure.

The essential unity of mathematics has been stressed by many investigators. In the words of Professor Lothar Kollatz of the University of Hamburg: "The author would be delighted to find that this book contributes to showing how absurd the distinction between 'pure' and 'applied' mathematics actually is; there is really no boundary that separates the two. There is only one mathematics, of which analysis, topology, algebra, numerical analysis, probability theory, etc., are merely some overlapping areas."

The next step, and the crucial one in this inquiry, is to determine the conceptual structure of abstract mathematics. Here lies the heart of the whole inquiry. The structure that will be established for this quadrant will then serve as a model for the structures in the other three quadrants, and thus preserve the integrity of the whole.

Structure of abstract mathematics

A preliminary structure for abstract mathematics can easily be constructed by drawing a Venn or Euler diagram with three overlapping circles for the three principal domains or dimensions of mathematics, labelled in turn 'geometry,' 'algebra,' and 'analysis,' where the term 'analysis' is used in the limited sense of the differential and integral calculus.



The diagram provides a set of pigeonholes for the intersections: geometry and algebra, geometry and analysis, and algebra and analysis.

One critical dimension in this analysis is the time dimension, often neglected in mathematics, to which we will return in greater detail. The time dimension is important only in the sense that it illuminates the present: How did we get to here from there?

We can now order the components of the Venn or Euler diagram in chronological sequence: 1. geometry; 2. algebra; 3. geometry algebra; 4. analysis; 5. geometry analysis; 6. algebra analysis; 7. geometry algebra analysis.

Although this simple model shows internal consistency, a moment's reflection shows

that it is incomplete because it fails to provide space for the topology of point sets and other consequences of the investigations of Georg Cantor.

Expansion of our original Venn or Euler diagram to four circles produces an unsatisfactory result, adding complexity where simplicity is needed and desired.

The solution is to discard the circular diagrams and replace them with a Veitch diagram or Karnaugh map of four dimensions: geometry, algebra, analysis, and topology of point sets. The eight cells of geometry cluster around the vertical axis, of algebra around the horizontal axis, of analysis in the top half and those of topology in the right half.

We can now order the intersections in chronological sequence as follows: 0. null set; 1. geometry; 2. algebra; 3. algebraic geometry; 4. analysis; 5. geometric analysis; 6. algebra analysis; 7. geometry algebra analysis; 8. topology; 9. geometric topology; 10. algebraic topology; 11. geometry algebra topology; 12. analysis topology; 13. geometry analysis topology; 14. algebra analysis topology; 15. geometry algebra analysis topology.

We can use a binary (or hexadecimal) numbering scheme for these intersections using four bits: 0001 for geometry, 0010 for algebra; 0100 for analysis; and 1000 for topology. Thus the intersection of all four would be labelled as 1111. The numbering scheme also preserves the historical sequence: 0000 for the null set, and 1111 for the intersection of the four dimensions.

			topol	topol	
analy	analy	analy	analy	analy	
4	geom	5	geom	D	C
			topol	topol	
analy	analy	analy	analy	analy	
alg	alg	alg	alg	alg	
6	geom	7	geom	F	E
			topol	topol	
alg	alg	alg	alg	alg	
2	geom	3	geom	B	A
			topol	topol	
null			geom	9	8
0	geom	1	geom		

To understand mathematics today one must understand its origins. The Karnaugh map or Veitch diagram provides a set of pigeonholes where the advances can be classified in chronological sequence. More importantly, the diagram provides a means of identifying and cataloging discoveries or inventions that are replications of earlier discoveries in a different guise. As the quadrants of our earlier rectangle mirror one another, so do the cells of the Veitch diagram mirror one another.

History of mathematics

The history of mathematics must be viewed in terms of paradigm shifts: new discoveries that caused a 'revolution' in the way that past mathematics was observed. The dimensions of our Veitch diagram or Karnaugh map are designed to conform to these

paradigm shifts, and the boxes are designed to accommodate them.

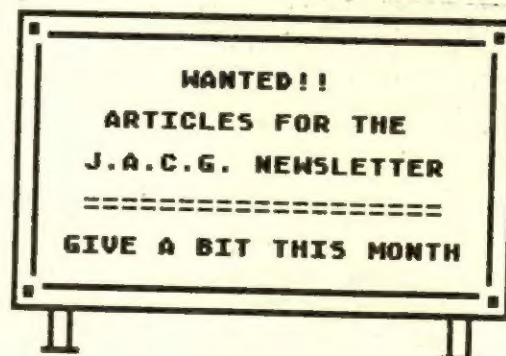
In the broadest possible perspective, there were four events that forever changed the course of mathematics. First was the publication of Euclid's Geometry around 300 B.C. Second was the discovery of algebra by al Khwarizmi and the publication in 1545 of the "Ars Magna" by Gerolamo Cardano. Third was the publication of Newton's Principia in 1687. And fourthly, the publication of Cantor's book on Transfinite numbers.

Within these developments were others that fill in the intersections of the diagram. The box for the null set serves as a repository for the investigations into logic started by Zeno of Elea in 600 B.C. The intersection of geometry and algebra is properly marked by the publication in 1637 of the appendix on geometry in the Discourse of Method of Rene Descartes. The intersection of geometry and analysis is marked by the publication by Karl Frederic Gauss of his volume on differential geometry entitled "General Investigations of Curved Surfaces." None of the later intersections, however, are as clearly marked.

We could attempt to fill in the boxes with the names of individuals who did outstanding work in each different area. This exercise would have some pedagogical interest, but lacks the precision needed for the rest of this inquiry.

A brief outline of the essentials of the history of mathematics (needed to fill in outlines of the model above) will be presented in the next chapter of this inquiry into the internal structure of the mathematical sciences.

"GEORGE, THE REPAIRMAN SAID IT WOULD BE TWO MORE DAYS ON YOUR ATARI!"



Rules For Merchant Sales at JACG Meetings

Commercial Sellers Must Advertise

The JACG Executive Committee has adopted the following policy concerning commercial sales at any JACG official meeting. The effective date of implementation will be with the July 14th, 1984 meeting.

1. Any merchant selling or renting products, selling services, or in any way promoting same at JACG club meetings must have an advertisement in the current or previous month's issue of the JACG Newsletter, 1/4 page minimum.

2. The number of merchants shall be restricted to three per meeting unless special permission is granted by the President. Preference will be given to current advertisers.

3. Each merchant will occupy no more than one table space or its equivalent. The JACG does not guarantee availability of tables.

4. Merchants are responsible for the return of all furniture they use to its original location and to leave their area neat and clean before leaving.

5. Merchants will check with the Advertising Manager for permission to set up prior to the meeting to have their qualification confirmed.

6. Merchants may not sell during the official meeting and must cease sales and clean up within 15 minutes after the end of the official meeting.

7. Any merchant violating these rules will be not allowed to operate at JACG functions until compliance is assured through the JACG Executive Committee.

8. A merchant is any person, or group of persons, who operate as a regular full or part-time business for the purpose of profit.

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